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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,638	08/29/2003	Douglas M. Baney	10030170-1	1820
57299	7590	08/11/2008	EXAMINER	
Kathy Manke			PAJOOHI, TARA S	
Avago Technologies Limited			ART UNIT	
4380 Ziegler Road			PAPER NUMBER	
Fort Collins, CO 80525			2886	
			NOTIFICATION DATE	DELIVERY MODE
			08/11/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/652,638

Applicant(s)

BANEY ET AL.

Examiner

Tara S. Pajoohi

Art Unit

2886

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-7 and 10-22 is/are pending in the application.
4a) Of the above claim(s) 19-22 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1, 3-7 and 10-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Response to Amendment

1. Acknowledgement is made to amendment filed on 04/18/2008.
2. Claims 19-22 are withdrawn from consideration.
3. Claims 2, 7 and 8 have been cancelled.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1 and 3-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hughes et al. (U.S. Patent No. 4,184,767)** in view of **Schultz (U.S. Patent No. 6,442,416)**.
6. Considering **claims 1, 3 and 5**, Hughes discloses (abstract and col. 2-5) and shows in figure 1, a method for determining the position of an object, comprising:
 - a. providing one or more EM beams (narrowband beams tuned or swept across a range of frequencies) (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth, col. 2, lines 6-10);
 - b. dispersing said one or more EM beams, restively, into a scanning space by frequency (i.e., frequency is scanned out of the laser source is directed to a dispersive element, col. 2, lines 12-16);
 - c. retro-reflecting at least a portion of the respective dispersed beams off of an object (30) (i.e., reflecting energy off of object (30) will be collected by collecting optics (50), col. 2, lines 20-31);

- d. determining, in response to frequencies associated with said retro-reflected beams, respective angular positions of the object (i.e., the frequency of the detected signal is determined by the laser detection system (60) and the change in elevation angle of the object is determined automatically, col. 2, lines 28-31); and
- e. triangulating spatial coordinates of said object using two or more (three or more) of said respective angular positions ($20'$, $20''$, $20'''$, ... 20 nth).

Hughes fails to specifically disclose providing at least two electromagnetic beams, being provided from two different EM sources.

In the same field of endeavor, an apparatus and method for determining the position and orientation of an object in space, Schultz discloses (abstract) providing at least two electromagnetic beams, being provided from two different EM sources.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources to provide at least two EM beams as taught by Schultz in the method of Hughes, since Schultz teaches (col. 3) that multiple EM beams emitted from different sources will provide for more accurate and convenient measurement of the three-dimension position of an object.

- 7. Considering **claim 4**, Hughes discloses the one or more EM beams are broadband beams (i.e., light with a broad spectral band, col. 4, lines 66-67).
- 8. Considering **claim 6**, Hughes discloses (col. 4, line 56 – col. 5, line 22) rotating the polarization state of the one or more EM beams and the retro-reflected beams such that the one or more EM beams and the retro-reflected beams are treated differently by polarizing beam splitters (302) located in respective paths.

9. **Claims 7 and 10-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hughes et al. (U.S. Patent # 4,184,767** in view of **Schultz (U.S. Patent No. 6,442,416)** and further in view of **Washington (U.S. Patent # 6,031,613)**.

10. Regarding **claims 7, 11 and 15-17**, Hughes discloses (abstract and col. 2-4) and shows in figure 1, a position determination system comprising:

- f. one or more EM sources that provide EM beams (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth, col. 2, lines 6-10);
- g. one or more beam dispersion devices (prism) (col. 3, lines 22-25) that respectively disperse the one or more EM beams into a scanning space by frequency, wherein the system is configured to be responsive to the retro-reflective object positioned within the scanning space such that the retro-reflective object retro-reflects at least a portion of the respective dispersed beams (i.e., frequency is scanned out of the laser source is directed to a dispersive element, which changes the frequency scan into a spatial scan, col. 2, lines 12-16) and one or more partially reflective surfaces (beam splitter 302) to direct the EM beams to the beam dispersion device and that pass the retro-reflected beams to the one or more receptors;
- h. one or more receptors that receive the respective retro-reflected beams and provide signals for determining the respective angular positions of the retro-reflective object (i.e., the frequency of the detected signal is determined by the laser detection system (60) and the change in elevation angle of the object is determined automatically, col. 2, lines 28-31); and
- i. triangulating spatial coordinates of said object using two or more (three or more) of said respective angular positions ($20'$, $20''$, $20'''$, ... 20^n).

Hughes fails to specifically disclose providing at least two electromagnetic beams, being provided from two different EM sources.

In the same field of endeavor, an apparatus and method for determining the position and orientation of an object in space, Schultz discloses (abstract) providing at least two electromagnetic beams, being provided from two different EM sources.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the position of an object with two different EM sources to provide at least two EM beams as taught by Schultz in the method of Hughes, since Schultz teaches (col. 3) that multiple EM beams emitted from different sources will provide for more accurate and convenient measurement of the three-dimension position of an object.

Still lacking the limitation that a processor is in signal communication with the one or more receptors such that the angular position of the object is determined based on their frequencies.

In the same field of endeavor, Washington discloses (col. 5, lines 55-65) a processor (150) in communication with a receptor (112) that determines in response to frequencies associated with the respective retro-reflective (102) beams, the angular position of the retro-reflective object.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a processor to analyze the signal received at the receptor to determine the angular position of the retro-reflective object as taught by Washington in the system of Hughes, since Hughes teaches that it would advantageously be TTL compliant (col. 5, lines 60-63).

Still lacking the limitation of the wavemeter.

However it would have been an obvious matter of design choice to use a wavemeter instead of a photodetector to detect the retro-reflected beams when using electromagnetic beams since a wavemeter is known in the art to be used to measure the distance between waves of EM waves.

11. Considering **claim 10**, Hughes shows in figure 4, adjusting the orientation of the polarization of the beam to elliptical polarization.

12. Considering **claim 12**, Hughes discloses (col. 2, lines 6-10) the one or more EM beams include narrowband beams tuned or swept across a range of frequencies (i.e., a continuous tunable laser source (10) tuning across a predetermined frequency bandwidth).

13. Regarding **claims 13 and 14**, the modified system of Hughes discloses (col. 2 of Hughes) photo-detectors (60) associated with the one or more receptors configured to detect receipt of the retro-reflected beams but fails to specifically disclose they a processor is configured to use /determine the frequencies which are associated with the retro-reflected beams to determine the angular position.

In the same field of endeavor, Washington discloses (col. 5, lines 55-65) a processor (150) in communication with a receptor (112) to determine the angular position of the object (102) based on the frequency of the output signal.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a processor to analyze the signal received at the receptor to determine the angular position of the retro-reflective object as taught by Washington in the modified system of Hughes, since Hughes teaches that it would advantageously be TTL compliant (col. 5, lines 60-63).

14. As per **claim 18**, Hughes discloses (col. 5-6) the use of polarized beamsplitters (401, 402 and 403), one or more polarization state rotators (404, 405, 406), a retro-reflective object and one or more receptors (60) but fails to specifically disclose the polarization rotators are positioned between the retro-reflected object and the polarization beam-splitter.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to position the polarization rotator between the polarization beam-splitter and retro-reflected object since it was known in the art that this setup is required for the polarization rotator to control the polarization state of the EM beam.

Response to Arguments

15. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tara S. Pajoochi whose telephone number is (571)272-9785. The examiner can normally be reached on Monday - Thursday 9:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on 571-272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tara S. Pajoohi
Patent Examiner

TSP

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